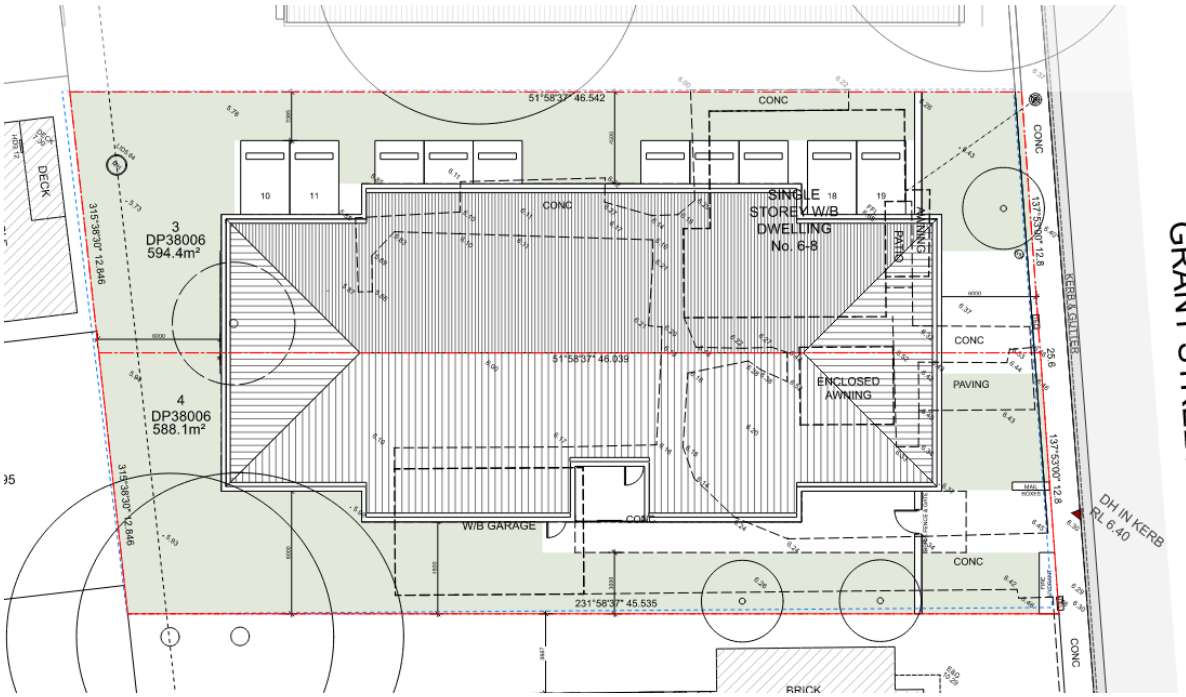
ECLIPSE | CONSULTING ENGINEERS

# Flood Impact Assessment

# Proposed Residential Development

# 8 Grant Street
# MAITLAND NSW




## For

Brown Commercial Building
2 Elwell Close
BERESFIELD NSW 2322

| | |
|---|---|
| Reference: | 10727-001-fia |
| Issue Date: | 1 March 2023 |
| Issue: | 1 |
| Status: | Development Application |

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# 1. Contents

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# 2. Introduction and Background

## 2.1. Purpose

The purpose of this flood risk analysis is to determine the flood risk on the proposed development site and demonstrate how the proposed development complies with the Maitland Development Control Plan 2011 and the Maitland Local Environmental Plan 2011.

The principal objectives of this report are to provide:

- A summary of Maitland City Council's flood controls.
- A review of how flooding affects the existing site.
- An analysis of how flooding is expected to affect the proposed development.
- A summary of how the proposed development meets Maitland City Council's flood controls.

## 2.2. Site Description

The site is described as Lots 3 & 4 in DP38006. The development site is addressed as 8 Grant St, Maitland. The location of the site is shown in Figure 2.1, below.

*Figure 2.1: Aerial photograph of the site location (SIX Maps, 2024)*

The site currently consists of a residential lot. The site is bounded by residential lots to the south, east, and west, and a commercial development to the north on the opposite side of Grant Street. The site slopes to the west with a grade of 1.0%.

The total site area is 1,176 $m^2$. The development's roof, pavement, and hardstand areas are 697 $m^2$ in total, or 59.3% of the total site area.

## 2.3. Proposed Development

The proposed development works include:

- Multi-unit residential dwelling, fifteen units over three floors. Total roof area = 582 $m^2$.
- External pavement and ground floor car parking areas. Total external pavement area = 115 $m^2$.
- Landscaped areas. Total pervious area = 479 $m^2$.

The catchment plan for the proposed development is shown in Figure 2.2.

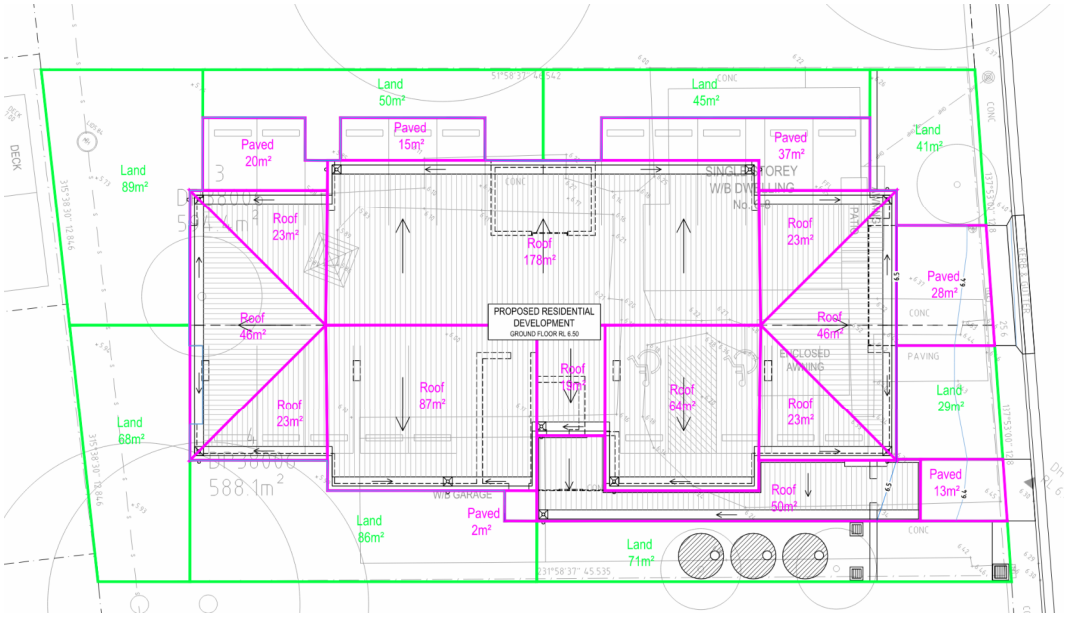


*Figure 2.2: Development catchment plan*

# 3. Flood Impact Assessment

## 3.1. Flood Behaviour

The following information has been provided for the proposed development site by Maitland City Council.

Figure 3.1 below indicates that the proposed development site is located within a Flood Planning Area, shown in hatched blue.


*Figure 3.1: Flood planning map (Maitland City Council, 2011)*

A pre-lodgement meeting was conducted for the proposed development on 8 November 2023. The following flood information was provided for the site:

- 1% AEP flood level: 9.73 mAHD
- Flood planning level: 10.23 mAHD
- Peak flood velocity: <0.5 m/s
- Site flood categorisation: Flood storage/flood fringe

Maitland City Council have confirmed that the 1% AEP flood level is 9.72 mAHD, resulting in a Flood Planning Level of 10.22 mAHD.

## 3.2. Maitland Council Floodplain Development Controls

The Maitland Local Environmental Plan 2011 Clause 5.21 provides that development consent must not be provided to developments on land the consent authority considers to be within the flood planning area unless the consent authority is satisfied the development:

- Is compatible with the flood function and behaviour on the land.

- Will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties.
- Will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood.
- Incorporates appropriate measures to manage risk to life in the event of a flood.
- Will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation, or a reduction in the stability of riverbanks or watercourses.

The Maitland Development Control Plan 2011 Section B.3 – Hunter River Floodplain Clause 2.1 – Development below the Flood Planning Level (FPL) provides that the proposed development must demonstrate:

- The proposed development will not increase the flood hazard or flood damage or adversely increase flood affectation on other properties, as assessed by a suitably qualified hydraulic engineer.
- The design of the proposed development is such that the risks of structural failure or damage in the event of flooding (including damage to other property) up to the FPL would be minimal, as assessed by a suitably qualified structural engineer.
- The proposed development has been designed to withstand the effects of inundation of floodwaters up to the FPL, with contents or fittings susceptible to flood damage being located above this level.
- If levees are proposed to protect a development, the impact of the levees on flood behaviour must be assessed and the habitable floor level of the proposed development behind the levee must still be set at or above the FPL (assuming no levee is in place).
- The proposed measures to allow the timely, orderly, and safe evacuation of people from the site (these measures should be permanent and maintenance free), and the measures proposed to safeguard goods, material, plant, and equipment in a flood. These measures should be compatible with the SES' Maitland City Local Flood Plan (including Vol 1: The Maitland City Flood Emergency Sub Plan).
    - In rural areas, the proposals for the evacuation of any livestock in a flood.
    - The measures to reduce the risks that the development will allow the accumulation and build-up of debris being carried by floodwaters (particularly associated with fences in flood liable areas).
    - The design complies with the Table 1: Flood Aware Design Requirements for Residential Development on Flood Prone Land.
    - Details of any proposed filling to be provided.

The flooding information provided by Maitland City Council indicates that on the existing site, the proposed development will experience flooding to a depth of 3.95 m at a velocity less than 0.5 m/s in the 1% AEP flood event.

In accordance with the Maitland Development Control Plan 2011 Section B.3 – Hunter River Floodplain Clause 3.4 – Hydraulic Category Maps, development site experiences peak floodwater velocities above 0.1 m/s and a velocity depth product > 1.0 $m^2/s$ in the 1% AEP flood event, leading to floodway categorisation. As such, the Maitland Development Control Plan 2011 Section B.3 – Hunter River Floodplain Clause 2.2 – Development in Floodways provides that the proposed development must demonstrate:

- No building or structure is to be erected on land identified as floodway on the Hydraulic Category Maps.
- No fill is permitted on land identified as floodway on the Hydraulic Category Maps.
- Minor alterations to ground levels associated with surface treatments, below ground structures, or minor landscaping are permitted provided they do not alter the flow distribution or flood behaviour within the floodway.
- New development shall be designed to avoid fences in floodways.

- Where dividing fences across floodways are unavoidable, they are to be constructed only of open type fencing that does not restrict the flow of flood waters. The fencing design should be resistant to blockage or designed to be collapsible under heavy flood loadings.
- Flood mitigation works are permitted with consent subject to Council being satisfied that the works meet the objectives of this DCP and the Flood Risk Management Plan. Note: Flood mitigation works are permitted without consent under the State Environmental Planning Policy (Transport and Infrastructure) 2021 if they are carried out by or on behalf of a public authority.
- Development within the vicinity of Hunter Valley Flood Mitigation Scheme structures (including levees, floodgates, spillways, and drains) operated by the NSW Office of Environment and Heritage are referred to that agency for concurrence in accordance with the Water Management Act 2000.

As the proposed development is within a floodway, the proposed development is not subject to Maitland Development Control Plan 2011 Section B.3 – Hunter River Floodplain Clause 2.3 – Fillling of Flood Storage and Flood Fringe Areas.

The Maitland Development Control Plan 2011 Section B.3 – Hunter River Floodplain Clause 2.3 – General Building Requirements provides the that the proposed development must demonstrate:

- All habitable finished floors shall be no lower than the FPL.
- Parts of buildings and structures at or below the FPL shall be constructed in accordance with Table 1: Flood Aware Design Requirements for Residential Development on Flood Prone Land. The development shall be certified by a qualified Structural Engineer that the building has been designed to withstand the depth of inundation, buoyancy, and flow velocity forces (including potential for debris impact) at the development site for a 1:100 ARI event.
- Flood-free access shall be provided from the development to an appropriate evacuation facility (as identified in the Maitland Local Flood Plan), at the 1:20 ARI flood level or higher.
- Provision shall be made for the safe evacuation of people from the development in accordance with the Maitland Local Flood Plan.
- Sufficient storage space for household effects shall be provided above the FPL.
- Electrical fixtures such as light fittings and switches shall be sited above the FPL unless they are on a separate circuit (with earth leakage protection) to the rest of the building.

The proposed development is not subject to the controls outlined in the Maitland Development Control Plan 2011 Section B.3 – Hunter River Floodplain Clauses 2.4 – Multi-Storey Residential Development, 2.5 – Basement Car Parking, 2.6 – Additions and Renovations, 2.7 – House Raising and Flood Proofing, 2.8 – Critical Infrastructure and Facilities, and 2.9 – Mitigating Circumstances.

### *Compliance with Maitland Development Controls for Flood-Affected Properties*

The proposed development site is located within a floodplain, and in accordance with the Maitland Development Control Plan Section B.3 – Hunter River Floodplain Clause 2.2 – Development in Floodways, the construction of new buildings on areas identified as floodways is not permitted. Due to the high depths experienced by the site in the 1% AEP event, the site is within a floodway. It is acknowledged that the site should not permit the development of new buildings. However, the proposed development proposes construction of a ground floor carpark close to existing surface levels, which will permit the flow of flood waters with minimal disturbance. The lowest habitable floor level is proposed to be 10.38 mAHD, 150 mm clear of the flood planning level of 10.23 mAHD.

The proposed structure will require certification from a structural engineer at construction stage that the structural design will withstand loading associated with floodwaters reaching the Flood Planning Level, including consideration for hydrostatic, hydrodynamic, and debris/impact loading. It is expected that the proposed development will not have any issues in being constructed from flood-proof and flood-resistant materials, and

that electrical circuits will be able to be located above the flood planning level or on dedicated circuits with earth leakage protection.

The development of a flood emergency response plan will be required at construction stage to ensure evacuation measured are in place for occupants of the proposed development.